

**Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application.

All claims currently being amended are shown with deleted text struckthrough or double bracketed and new text underlined. Additionally, the status of each claim is indicated in parenthetical expression following the claim number.

The current disposition of the claims are as follows: Claims 36-68, 88-93, and 130 are pending in this Application; Claims 36-68, 88-93, and 130 are rejected by the Examiner.

In response, Applicant takes the following actions: Applicant amends Claim 40 to correct a grammatical error. Applicant amends Claims 36, 38, 68, 88, and 89. Applicant traverses Examiner's rejections of Claims 36-68, 88-93, and 130.

**WHAT IS CLAIMED IS:**

1-35. (Cancelled)

36. (Currently Amended) A product made by the process comprising:
  - (a) selecting a plurality of carbon nanotubes; and
  - (b) reacting the plurality of carbon nanotubes with a diazonium specie to form derivatized carbon nanotubes, wherein a derivation occurs along the sidewalls of the carbon nanotube.
37. (Previously Presented) The product of claim 36 further comprising dispersing the derivatized carbon nanotubes in a solvent.
38. (Currently Amended) A product made by the process comprising:
  - (a) selecting an assembly of single-wall carbon nanotubes;
  - (b) immersing the assembly in a solution comprising a diazonium specie; and

- (c) applying a potential to the assembly to electrochemically react the assembly with the diazonium specie, wherein a reaction occurs along the sidewalls of the single-wall carbon nanotubes.
39. (Previously Presented) The product of claim 36 further comprising performing a diazonium species.
40. (Currently Amended) The product of claim 36 further comprising:
- (a) (c) mixing a precursor of a diazonium specie with the plurality of single-wall carbon nanotubes; and
  - (d) generating the diazonium specie, wherein the plurality of carbon nanotubes is a plurality of single-wall carbon nanotubes.
41. (Previously Presented) The product of claim 36, wherein the plurality of carbon nanotubes comprise single-wall carbon nanotubes.
42. (Previously Presented) The product of claim 41, wherein the single-wall carbon nanotubes have an average diameter of at most about 0.7 nm.
43. (Previously Presented) The product of claim 36 wherein the plurality are electrochemically reacted with the diazonium specie.
44. (Previously Presented) The product of claim 36, wherein the plurality are thermally reacted with the diazonium specie.
45. (Previously Presented) The product of claim 36, wherein the diazonium specie is generated *in situ*.
46. (Previously Presented) The product of claim 36, wherein the diazonium specie is preformed before the plurality are thermally reacted with the diazonium specie.
47. (Previously Presented) The product of claim 36, wherein the plurality are photochemically reacted with the diazonium specie.

48. (Previously Presented) The product of claim 36, wherein the diazonium specie comprises an aryl diazonium specie.
49. (Previously Presented) The product of claim 36, wherein the diazonium specie comprises a species selected from the group consisting of an alkyl diazonium specie, an alkenyl diazonium specie, an alkyny diazonium specie, and combinations thereof.
50. (Previously Presented) The product of claim 36, wherein the plurality is an assembly of carbon nanotubes.
51. (Previously Presented) The product of claim 36, wherein the assembly is selected from the group consisting of a bucky paper and a mat.
52. (Previously Presented) The product of claim 50 further made by the process comprising:
  - (a) immersing the assembly in a solution comprising the diazonium specie; and
  - (b) applying a potential to the assembly.
53. (Previously Presented) The product of claim 52, wherein the potential is a negative potential.
54. (Previously Presented) The product of claim 52, wherein the solution further comprises a supporting electrolyte specie.
55. (Previously Presented) The product of claim 52, wherein the step of applying a potential to the assembly comprises holding the assembly with an alligator clip treated with a colloidal silver paste.
56. (Previously Presented) The product of claim 36, wherein the diazonium specie comprises an diazonium salt.
57. (Previously Presented) The product of claim 56, wherein the diazonium salt comprises a salt selected from the group consisting of an aryl diazonium salt, an alkyl diazonium salt, an alkenyl diazonium salt, an alkyny diazonium salt, and combinations thereof.

58. (Previously Presented) The product of claim 36, further made by the process comprising sonicating the derivatized carbon nanotubes.
59. (Previously Presented) The product of claim 36, wherein the amount of a moiety bonded to the carbon atoms of a carbon nanotube is at a moiety to carbon ratio at least about one moiety to forty carbon atoms.
60. (Previously Presented) The product of claim 36, wherein the amount of a moiety bonded to the carbon atoms of a carbon nanotube is at a moiety to carbon ratio at least about one moiety to thirty carbon atoms.
61. (Previously Presented) The product of claim 36, wherein the reaction is a thermal reaction at a temperature of at most about 200° C.
62. (Previously Presented) The product of claim 36, wherein the reaction is a thermal reaction at a temperature of at most about 60° C.
63. (Previously Presented) The product of claim 36 further comprising removing functional moieties from the derivatized carbon nanotubes.
64. (Previously Presented) The product of claim 36 further comprising photochemically treating the mixture of the plurality of single-wall carbon nanotubes and the diazonium specie.
65. (Previously Presented) The product of claim 64, wherein the photochemical treatment comprises the use of an ultraviolet light source.
66. (Previously Presented) The product of claim 64, wherein the photochemical treatment comprises the use of a visible light source.
67. (Previously Presented) The product of claim 40, wherein the precursor of the diazonium specie is an aniline derivative precursor of the diazonium specie and the diazonium specie is generated with a nitrite.

68. (Currently Amended) A solution of single-wall carbon nanotubes made by the process of:
- (a) a plurality of derivatized single-wall carbon nanotubes, wherein the plurality of derivatized carbon nanotubes were derivatized utilizing a diazonium specie and a derivation occurs along the sidewall of the carbon nanotube; and
  - (b) a solvent, wherein the derivatized plurality of carbon nanotubes are dispersed in the solvent.

69-87. (Cancelled)

88. (Currently Amended) A product made by the process comprising:
- (a) preparing an assembly, wherein
    - (i) the assembly comprises a first plurality of carbon nanotubes and a second plurality of carbon nanotubes; and
    - (ii) wherein the carbon nanotubes in the first plurality and the carbon nanotubes in the second plurality can be individually addressed electronically;
  - (b) immersing the assembly in a diazonium specie; and
  - (c) applying a negative potential to the assembly to cause the first plurality to essentially come in contact with the second plurality; and
  - (d) electrochemically reacting the assembly with the diazonium specie so as to foster a side-wall reaction for the plurality of carbon nanotubes.
89. (Currently Amended) A product made by the process comprising:
- (a) preparing an assembly of carbon nanotubes
  - (b) immersing the assembly in a first diazonium specie;
  - (c) applying a potential to the assembly in a first direction;
  - (d) electrochemically reacting the assembly with the first diazonium specie so as to foster a side-wall reaction with the assembly;
  - (e) immersing the assembly in a second diazonium specie;
  - (f) applying a potential to the assembly in a second direction; and
  - (g) electrochemically reacting the assembly with the second diazonium specie.

90. (Previously Presented) The product of claim 88, wherein the carbon nanotubes of the first plurality comprise single-wall carbon nanotubes and the carbon nanotubes of the second plurality comprise single-wall carbon nanotubes.
  91. (Previously Presented) The product of claim 88, wherein the assembly is a crossbar architecture of carbon nanotubes.
  92. (Previously Presented) The product of claim 88, wherein the preparation of the assembly comprises fluid flow over a patterned surface.
  93. (Previously Presented) The product of claim 88, wherein the preparation of the assembly comprises direct carbon nanotube growth between posts.
- 94-129. (Cancelled)
130. (Currently Amended) A product made by the process comprising:
    - (a) selecting a plurality of single-wall carbon nanotubes; and
    - (b) reacting the plurality of carbon nanotubes with a diazonium specie to form [[sidewall]] derivatized carbon nanotubes with derivations along the sidewall of the nanotube.